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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/735,053
Filing Date: December 12, 2003
Appellant(s): PINGALI ET AL.

Jeffrey R. Ambroziak
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/02/2006 appealing from the Office action mailed 12/29/2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

GROUNDS OF REJECTION NOT ON REVIEW

The following grounds of rejection have not been withdrawn by the examiner, but they are not under review on appeal because they have not been presented for review in the appellant's brief. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. in view of Raskar et al. and Connely et al. as applied to claims 1-3, 5, 6, 15-32, and 34-40 and further in view of Machtig (US 5,278,596.)

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,793,350	RASKAR et al.	9-2004
5,114,224	MIYAMOTO et al.	5-1992
2003/0202156	CONNELLY et al.	10-2003
5,278,596	MACHTIG	1-1994
6,431,711	PINHANEZ	8-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Note: The following Grounds of Rejection have been re-written from that in the final rejection of 12/29/2005 for better clarity and form. Neither the grounds of rejection nor the basic contents of said rejection have been changed.

I. Claims 1-3, 5, 6, 15-32, and 34-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. (US 5,114,224) in view of Raskar et al. (US 6,793,350) and Connelly et al. (US 2003/0202156.)

Miyamoto teaches in figure 1 a positioning system comprising, at least one mount (10) for mounting a projection unit, the projection unit comprises of at least a projector (11), wherein the at least one mount is coupled to a mechanism (10) for providing rotational movement for adjusting one of a position and an orientation of the projection unit (turn table 10 as outlined in column 2 lines 65-68 can turn the projection unit in the horizontal and vertical directions.

Miyamoto does not specifically teach that a distorted image is projected, however Miyamoto as can clearly be seen in figure 1 and as outlined in column 1 lines 7-18 is directed to projecting on a clearly curved or irregularly shaped objected such as an airship or a balloon. Raskar et al. teaches in column 1 line 67 though column 2 line 9 that when large curved displayed surfaces such as a planetarium or similarly the side of blimps or large balloons are projected upon except when projecting from a so called "sweet-spot"

(see Raskar column 2 line 8) the projected image is highly distorted and few if any viewers are able to make out what is being projected. Accordingly one of ordinary skill in the art at the time the invention was made would recognize that in light of the teachings of Raskar in column 1 line 67 through column 2 line 9 that absence any additional mechanism or method, the projector of Miyamoto would project a substantially distorted image.

While Miyamoto alone or in view of Raskar teach a mechanism for providing rotational movement it lacks a teaching of a mechanism for providing translational movement. Connelly teaches in figure 1a such a mechanism for providing translational movement for adjusting the position of a projection unit mounted on it. Connelly teaches in paragraphs 9-11 that such a translation movement system allows for more versatility in positioning a projector eliminating or at least substantially reducing keystone distortion, which those of ordinary skill in the art would recognize is caused by the projector not being in the "sweet-spot". Given the teaching of Connelly that such translation movement allows for the projection unit to produce a substantially undistorted image on a surface and would further in the case of Miyamoto allow more versatility in tracking an object such as a tethered balloon or blimp since the projector can follow it both rotationally and translational, it would have been obvious to one of ordinary skill in the art at the time the invention was made to mount the mounting unit of Miyamoto such that it can have translational movement as taught by Connelly which would result in an undistorted image on the surface greatly enhancing the effectiveness of the projection unit so viewers can enjoy an undistorted image.

With regards to appellant's claims 2 and 3:

Miyamoto teaches in figure 11 an alternative embodiment where a redirection device (30) is used, as taught in column 5 lines 24-35 that by making the actual projection parts stationary and using a redirection device that move rotationally, better control can be maintain in environments where the surface to be projected upon moves quickly. Accordingly in such environments it would have been obvious to use such a redirection device as taught by Miyamoto in figure 11 to insure a fast response time. With regards to claim 3 the redirection device is a mirror.

With regards to appellants claim 5:

The projector of Miyamoto is coupled to a controller (100).

With regards to appellants claim 6:

The controller of Miyamoto is remote (i.e. not mounted on the projection unit see figure 1 which clearly shows it as a stand alone unit.)

With regards to appellants claim 15:

The mechanism for providing translational movement as taught by Connelly is a rail system (parts 106 are rails). Given that Connelly teaches that its mechanism for translational movement which includes the rails allows for more versatility and a better projection image (reduces keystone and other off-axis distortions), it would have been obvious to one of ordinary skill in the art at the time the invention was made to include

the rails of Connelly in the mechanism for providing translational movement and rotational movement in the positioning system of Miyamoto in view of Raskar and Connelly.

With regards to appellant's claim 16:

The rails of Connelly are clearly fixed to a surface (rectangle they are shown to rest upon.) One of ordinary skill in the art would recognize the rails must be mounted on something, since the proper alignment of the rails would not otherwise be maintained. Since Connelly teaches such a surface, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a surface for the rails to be fixed to as taught by Connelly in the system of Miyamoto in view of raskar and Connelly as this would allow the system to function.

With regards to appellant's claim 17:

Part 4 of Miyamoto is a controller that clearly directly controls the mount of Miyamoto.

With regards to appellant's claim 18:

As described in column 3 lines 42-52 and column 4 lines 34-58 of Miyamoto, geometric information is used in determining the projection position. (Cartesian coordinates are a type of geometric information, X and Y are Cartesian coordinates describing geographic positions.)

With regards to appellant's claim 19:

The system of Miyamoto includes part 12 which serves as tracking and sensing equipment for identifying a position of the at least one projector.

With regards to appellant's claim 20 and 22:

The mount of Miyamoto can position the projector with two degrees of freedom (horizontal and vertical see column 2 lines 65-68).

With regards to appellant's claims 21 and 23:

Miyamoto in view of Connelly allows for 3 degrees of freedom (the additional translational degrees of freedom are at least a 3rd degree of freedom.)

With regards to appellant's claims 24-28 and 32:

See above where the method of using the projector to make an undistorted image upon a surface is obvious in light of the projector that does so.

With regards to appellant's claim 29:

Connelly teaches the system can be used with two projector or more and as taught by Raskar in column 1 lines 15-21 for an exceptionally large display surface, it is beneficial to use multiple projectors in order to make a good image. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the multiple projectors of Connelly (or Raskar) as it allows for a good image to

be produced on a large display surface such as the Blimp of Miyamoto if it is of large enough size.

With regards to appellant's claim 30 and 31:

While Miyamoto in view of Connelly does teach the use of more then one projector they do not specifically teach wherein the projection unit produces a first portion of the distorted image and the at least another projection unit produces another portion of the distorted image. Raskar teaches in figure 1 a method for projecting an undistorted image upon a curved image with more then one projector, which includes projecting a structure light pattern (calibration image as is claimed in appellant's claim 31). As shown in figure 4 of Raskar multiple projectors can be used in projecting on large curved surfaces and a first projection unit produces a first portion of the distorted image and a second projection unit produces another portion of the distorted image. Raskar teaches that prior art methods of projecting on large curved or irregular shaped surfaces with stationary projectors required several hours each day to align (see column 1 liens 60-65), this clearly not an option with the projection system of Miyamoto in view of Connelly as the projected surface moves. Raskar teaches that Raskar's method allows for projecting on curved display surfaces with easy calibration (See column 2 lines 55-63.) Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Raskar's method of projecting with multiple projectors/cameras on large curved surfaces in the method of projecting taught by Miyamoto alone or in view of Connelly as the method of Raskar would allow for quick calibration and the use of

multiple projectors which would allow for re-alignment at an interval practical to a moving display surface such as that taught by Miyamoto.

With regards to appellant's claim 34:

Parts 4 and 100 of Miyamoto are basically a computer that executes a computer program for positioning a projection unit to provide a substantially undistorted image upon a surface (see above for the method of doing so.)

With regards to appellant's claims 35-38 and 40:

See above with regards to claims 1, 21, 1, 5, and 18 respectively.

With regards to appellant's claim 39:

Since the display is viewed by viewers and moves, the region where the image is undistorted can be considered an interactive region since at least the projector of Miyamoto interacts with the surface to be projected upon which is moving.

II. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. in view of Raskar et al. and Connelly et al. as applied to claims 1-3, 5, 6, 15-32, and 34-40 above, and further in view of Machtig (US 5,278,596.)

As described in more detail above, Miyamoto in view of Raskar and Connelly teaches a positioning system for a projector, which among other thing includes a redirection device, however Miyamoto in view of Raskar and Connelly does not teach the

use of optical fiber, and lenses for redirecting projected light. Machtig teaches in column 1 line 64 through column 2 line 18, that such a system allows for the light source to be kept separate form the heat sensitive components and it also allows for mechanisms allowing the projector to be moveable without sacrificing brightness of the projected image. Accordingly since it would be desirable to use as bright of a projector as possible to project on the distant moving screens of Miyamoto; it would have been obvious to one of ordinary skill in the art at the time the invention was made to include optical fiber to channel light from a stationary light source to the redirection device.

III. Claims 7-13 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. in view of Raskar et al. and Connelly et al. as applied to claim1-3, 5, 6, 15-32, and 34-40 above, and further in view of Pinhanez (US 6,431,711.)

As described in more detail above, Miyamoto in view of Raskar and Connelly, teaches a positioning system which among other things comprises a projector and a mechanism for providing both translational movement and rotational movement. Miyamoto in view of Connelly do not teach that the system is used for user interaction. Pinhanez teaches a similar system to that of Miyamoto in view of Raskar and Connelly in figures 8 and 9 (which in figure 9 includes layout information such as the location of the "yes" and "no" as is claimed in appellant's claim 33). Pinhanez's system further includes an interactivity portion allowing interaction between people and a projector (see column 2 lines 15-25.) Pinhanez teaches in column 1 lines 54 through column 2 line 2, that having an interactive region for a user interaction has the advantage of allowing a user to

change slides or other video medium without having to break the flow of the presentation. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the projection system of Miyamoto in view of Raskar and Connelly interactive as taught by Pinhanez since such a system allows a user (or plurality thereof) to take even greater advantage of the moving projection screen of Miyamoto (for instance a user could bring the screen to them and control part of the presentation and then it could be moved to another user to do likewise without having to deal with moving the computer or remote control around which can cause some difficulties.)

With regards to appellant's claim 8:

Pinhanez teaches a variety of uses for such a system at column 15 lines 60-61 including bringing up diagrams and one of ordinary skill in the art would also expect it to include such things as starting playing of a video on a remote video player as this is the advantage of Pinhanez that things operated either by moving the controller around or a remote control can be controlled just by interaction and accordingly one of ordinary skill in the art at the time the invention was made would have found it obvious to have the system of Miyamoto in view of Raskar and Connelly to include the interactive ability of Pinhanez including wherein the user interaction comprises an instruction for operation of external equipment, so that one can easily use the system (see above with regards to 7.)

With regards to appellant's claims 9-11:

The mounts of Miyamoto in view of Raskar and Connelly in view of Pinhanez would be used to hold the interactive recognition system.

With regards to appellant's claim 12:

Both Pinhanez and Miyamoto teach cameras. (Part 12 in Miyamoto.)

With regards to appellant's claim 13:

Pinhanez teaches using voice in column 12 lines 39-45, which one of ordinary skill in the art at the time the invention was made would recognize that this makes interacting with the system more convenient for such tasks as dictating text.

With regards to appellant's claim 33:

The method of using the projection system of Miyamoto in view of Raskar and Connelly and Pinhnez is obvious.

(10) Response to Argument

I. Rejection of claims 1-3, 5, 6, 15-32, and 34-40 under 35 U.S.C. § 103(a) in view of Miyamoto et al. further in view of Raskar et al. and Connelly et al.

Appellant argued that Miyamoto does not teach projecting a distorted image either alone or in combination with Raskar et al. since it would not be obvious to combine the teachings of Raskar with regards to projecting on quadric surfaces and other curved surfaces with that of Miyamoto as Miyamoto projects on a surface that is in constant motion and such a combination would render Miyamoto unsatisfactory for its intended purpose. (See appellant's Issue A: Argument 1 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Appellant's argument was based on the differences between the surfaces to be projected upon in Miyamoto and Raskar. Miyamoto as shown in figure 1 projects on a floating object (1) such as a balloon that moves and is tracked by the projecting device (11). Raskar as alleged by appellant teaches a method for projecting images on a stationary object. Appellant concludes that based on these differences that the teachings of Raskar are not applicable to positioning system and projecting system of Miyamoto.

Claim one reads in part "the projection unit comprised of at least a projector for projecting a distorted image". It is clear from figure 1 of Miyamoto that a projection unit (11) is provided that projects an image (see the reproduction of figure 1 below where

arrow A inserted by the examiner points to the projected image), which produces an image (arrow B) on the side of the floating object (1).

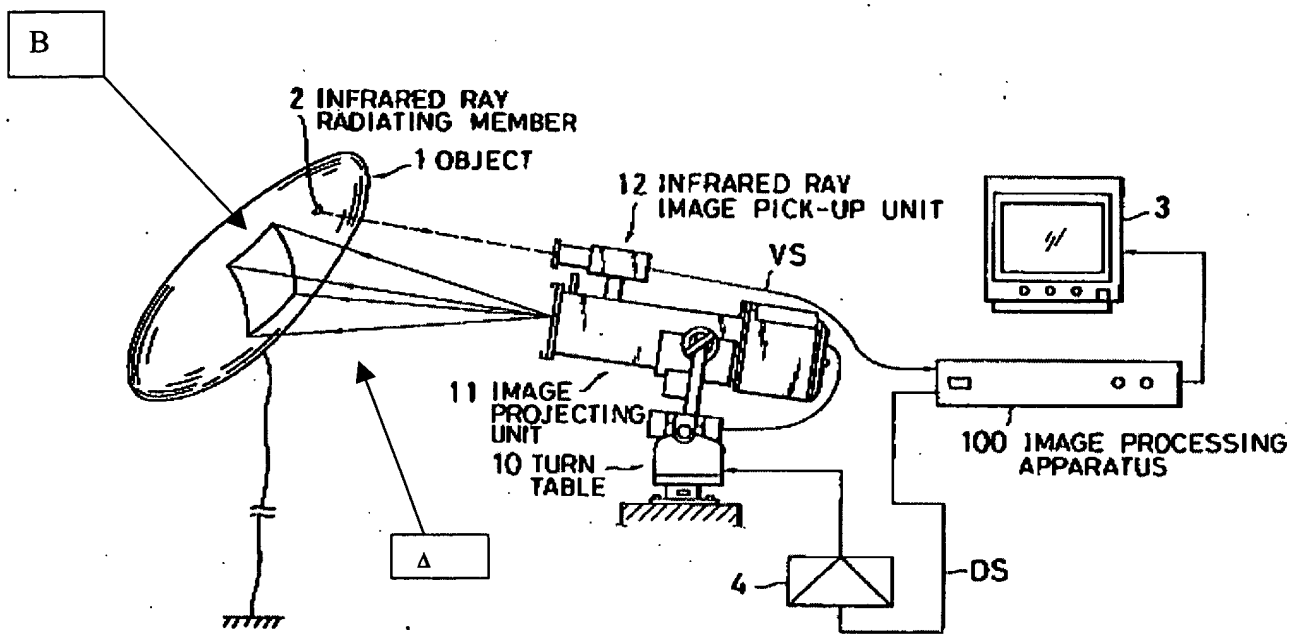

FIG.1

While from inspection it appears that the image produce on the object is in fact distorted (the image at arrow B inserted by the examiner is not flat or square) thus meeting the claim limitation, Miyamoto does not literally or specifically teach that it is distorted, however, Raskar et al. teaches in column 1 line 67 through column 2 line 9 that anytime that a projector projects on a large curved object which would include the object of Miyamoto, unless the projector is at the so called "sweet-spot" (column 2 line 8), the image when viewed by viewers will inherently be viewed as distorted. Accordingly one

of ordinary skill in the art at the time the invention was made would have recognized that absent any teaching of a correction device (such as that taught elsewhere in Raskar) or a specific teaching that the projector is maintained at the "sweet-spot" the image projected by the projection unit (11) of Miyamoto would be distorted thus meeting the limitation of claim 1.

Based on this analysis it appears that appellant has become confused with regards to the Raskar reference. While the Raskar reference is used later in the rejection to specifically teach a method of projecting using multiple projectors and a distortion correction method when doing so, it is not used to teach producing the substantially undistorted image on the surface. It is only provided to show evidence that one of ordinary skill in the art would recognize that the image projected by the projecting unit (11) on a curved object would be distorted. "In considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda,* 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968). The Raskar reference simply shows what inference one skilled in the art would reasonably be expected to draw from the Miyamoto reference. Accordingly one of ordinary skill in the art at the time the invention was made would recognize that Miyamoto alone does teach projecting a distorted image as is evidenced by Raskar.

Appellant argued that since Miyamoto makes no mention of distorted or undistorted images there was no motivation for either Raskar or Connelly to correct for said distortions. (See appellant's Issue A: Argument 1 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Appellant's argument was that since Miyamoto makes no mention of a distorted image, there was no motivation for the combination of Miyamoto with either Raskar or Connelly to correct for said distortions. As discussed above Miyamoto as evidenced by Raskar does teach a distorted image. One of ordinary skill in the art would recognize that it is not desirable to view distorted images and accordingly that one would be motivated to find a means for correcting the distortion. Raskar teaches in column 1 line 67 through column 2 line 9 that this distortion can be lessened by several mechanical means such as placing the projector in a narrow sweet spot and by using special lenses, however Raskar does not elaborate on these means (since Raskar teaches its own digital method that is applicable and more efficient for the specific application of Raskar of multiple tiled projectors.) Connelly teaches a mechanism by which the projector is moved translationaly into said "sweet-spot" (Connelly calls the "sweet-spot" the "centerline" of the screen) in order to eliminate at least some of the distortion (paragraph 9 and 10). There is, therefore, a clear teaching that the apparatus of Miyamoto projects a distorted image and one of ordinary skill in the art at the time of the invention would be motivated to modify the apparatus of Miyamoto so that it could be adjust to not project a distorted image (or at least project a substantially undistorted image) by moving the projector. Both Raskar and Connolly give the same

motivation for modifying the apparatus of Miyamoto and Connolly to project a substantially undistorted image and Connolly teaches a means and a method for doing so which when implemented would result in a better substantially undistorted image greatly improving the viewing experience of any viewers. Accordingly as has been shown Miyamoto does project a distorted image and there is motivation for Connelly to correct for the distorted images.

Appellant argued that Miyamoto alone does not teach translational movement, only rotational movement and that Miyamoto does not teach that this rotational movement produces from the distorted image a substantially undistorted image on a surface. (See appellant's Issue A: Argument 1 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner agreed, however this is irrelevant since claims 1-3, 5, 6, 15-32, and 34-40 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Miyamoto et al. in view of Raskar et al. and Connelly et al. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller,* 642 F. 2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co., Inc.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Connelly teaches the translational movement and the producing from the distorted image a substantially undistorted image on a surface as is claimed.

Appellant argued that Connelly does not teach a projector for projecting a distorted image and producing from the distorted image a substantially undistorted image on a surface. (See appellant's Issue A: Argument 1 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Connelly teaches in paragraph 9 that when a projector is not places at a projection surface's (screen) centerline (the "sweet-spot" of Raskar et al.) keystone distortion and focusing problems occur (both result in a image on the screen that appears distorted to a viewer as was known to those of ordinary skill in the art at the time the invention was made). In paragraph 11 a solution to this problem is presented; the projector mounted on a rail system allowing as stated in the 7th line translational movement so that the projector can be properly aligned with the centerline of the projection surface, which in light of the teaching's of Raskar would substantially eliminate distortion for at least a substantial amount of the viewers who are substantially close to the "sweet-spot".

Connelly's mechanism only provides translational movement not both translational movement and rotational movement. (See appellant's Issue A: Argument 2 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner agreed, however this is irrelevant since claims 1-3, 5, 6, 15-32, and 34-40 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Miyamoto et al. in view of Raskar et al. and Connelly et al. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of

references. *In re Keller,* 642 F. 2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co., Inc.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Connelly teaches the translational movement and the producing from the distorted image a substantially undistorted image on a surface as was claimed, while the primary reference of Miyamoto teaches the rotational movement. The combination of Miyamoto, Raskar et al. and Connelly et al. teaches both Translational movement and rotational movement for adjusting one of a position and an orientation of the projection unit to produce form the distorted image a substantially undistorted image on a surface.

Appellant argued that the combination of Miyamoto, Raskar, and Connelly would not result in a projection unit that results in a substantially undistorted image on a surface due to the mechanism for providing translational movement and rotational movement but rather due to the distortion correction taught by Raskar. (See appellant's Issue A: Argument 2 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. The appellant was arguing that the Raskar reference was being used to teach a distortion correction method while the Connelly reference was teaching only a mechanism for providing translational movement. While the Raskar reference does teach a distortion correction method, with regards to at least claims 1-3, 5, 6, 15-29, 32, and 34-40 that particular correction method is irrelevant since appellant only claims a single projector per image where the substantially undistorted image on a surface is produced by adjusting one of a position (by translational movement) and an orientation (by rotational movement). The Connelly reference clearly teaches that by

translationaly moving a projector on rails distortion in an image projected by said projector can be substantially reduced (that is it is reduced by some amount), that is to say the Connelly reference clearly teaches a mechanism for providing translational movement which adjust the position of projector resulting in a substantially undistorted image as is claimed by the appellant. Since as has been established above one of ordinary skill in the art at the time of the invention would have been motivated to modify Miyamoto to include the translational mechanism of Connelly, the combination of Miyamoto in view of Raskar et al. and Connelly et al. does result in a projection unit which includes a mechanism for providing translational movement for adjusting an orientation of the projection unit to produce a substantially undistorted image on a surface as claimed.

Appellant argued that Miyamoto neither teaches projection of a distorted image nor teaches a motivation for projecting a distorted image. (See appellant's Issue A: Argument 3 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Appellant argued in argument 3 that the examiner has argued that Miyamoto "must project at least a slightly distorted image" without reciting any teaching or recitation of Miyamoto disclosing such a teaching. As was discussed above Miyamoto does not explicitly state that the image projected was a distorted image. First, Miyamoto does show a slightly distorted image in figure 1 as shown by arrow B, since drawings must be evaluated for what they reasonably disclose and suggest to one of ordinary skill in the art, this drawing must be taken as sufficient evidence that Miyamoto

does suggest such a teaching (see *In re Aslanian,* 590 F. 2d 911, 200 USPQ 500 (CCPA 1979).) Second Raskar et al. teaches in column 1 line 67 through column 2 line 9 that anytime that a projector projects on a large curved object which would include the object of Miyamoto, unless it is the so called "sweet-spot" (column 2 line 8), the image when viewed by viewers will inherently be viewed as distorted. This teaching by Raskar provides evidence of a implicit disclosure by Miyamoto that one of ordinary skill in the art at the time the invention was made would recognize that Miyamoto projects a distorted image (see *In re Preda,* 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).)

Appellant argued that Raskar does not teach that is a necessity to pre-distort an image projected on a curved surface. (See appellant's Issue A: Argument 3 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. The appellant appeared to argue that projecting a distorted image as claimed by appellant requires an active action by the projector in order to avoid projecting a simple undistorted image. As has been made clear by both Raskar and by Connelly this simply was not true. One of ordinary skill in the art at the time the invention was made as was taught by both Raskar and Connelly would recognize that unless the projector was carefully aligned with the "sweet spot" or "centerline" of any screen especially curved ones, would naturally project a distorted image. Appellant even acknowledges as much on the 14th page of the amended appeal brief when appellant states "As such a spot is an infinitesimal singularity, Raskar therefore makes clear that all viewing of a projected image, with the exception of that occurring exactly at the sweet

spot, involves some distortion." Accordingly it is irrelevant whether Raskar or if any of the other references teaches a necessity to pre-distort an image, since unless the projector is at the "sweet spot" or centerline" and/or the viewer is also at it in the case of a curved screen the image will already be distorted meeting that limitation of appellants claims.

Appellant argues that the combination of Miyamoto and Raskar would be inoperable and would not be obvious. (See appellant's Issue A: Argument 3 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Appellant argued that Miyamoto is directed to a projection system that projects on a moving surface, while Raskar's method is for projecting on a stationary surface, that modifying Miyamoto as taught by Raskar would render Miyamoto inoperative as it would require the surface to be stationary at least long enough for Raskar's calibration method. Appellant's argument at least with regards to claims 1-3, 5, 6, 15-29, 32, and 34-40 are moot as it is irrelevant how Raskar corrects for distortion; Raskar is only being provided to teach that when projecting on curved surfaces a distorted image will normally be projected, not how Raskar specifically corrects for such distortions. While Raskar does teach its own digital method for correcting for distortions, the specific method is not applicable to claims 1-3, 5, 6, 15-29, 32, and 34-40 as the method is a digital method that is applicable for multiple tiled projector and the resulting substantially undistorted image is not the result of adjusting one of a position and an orientation of the projection unit, such a method is taught by Connelly et al. Accordingly the combination of Miyamoto and Raskar would not render the apparatus of

Miyamoto inoperable, since the pertinent teaching of Raskar is a feature that one of ordinary skill in the art at the time the invention was made would expect to be present in Miyamoto absent any modification.

Appellant argued with regards to claims 5 and 6 that Miyamoto alone or in combination with Raskar et al and Connelly et al does not teach that the projector was coupled to a controller for generating the distorted image. (See appellant's Issue A: Argument 4 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Appellant argues that since as appellant argued previously Miyamoto does not generate a distorted image, its controller does not generate a distorted image. However as has been pointed out repeatedly above, Miyamoto does intrinsically teach projecting a distorted image and therefore the controller (part 100 of Miyamoto) which generates the image which one of ordinary skill in the art at the time the invention was made would recognize is distorted is accordingly a controller for generating the distorted image.

Appellant argued with regards to claims 18 and 40 that Miyamoto alone or in combination with Raskar et al. and Connelly et al. does not teach that the position controller comprises a source of geometric model information. (See appellant's Issue A: Argument 5 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. The appellant argued that Miyamoto does not disclose the controller using geometric model information for controlling the positioning system.

Miyamoto discloses in column 4 lines 34-58 how the positioning system tracks the moving surface. Based on captured X and Y data (geometric modeling information, since Cartesian coordinates are a type of geometric information) the movement of the surface was calculated and the appropriate movement of the positioning system was calculated using the method described in column 4 lines 34-58 of Miyamoto. Since Cartesian coordinates are a mathematical means of representing geometrical quantities, they are a form of geometrical model information of which the controller of Miyamoto uses.

Appellant argued with regards to claim 31 that Miyamoto alone or in combination with Raskar et al. and Connelly et al. using geometric model information for setting the target surface, storing the geometric model data and repeating. (See appellant's Issue A: Argument 6 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Appellant argued that Raskar only teaches calibration (producing geometric model information) once and therefore the combination of Miyamoto in combination with Raskar et al. and Connelly et al. cannot teach the method of using geometric model information for setting the target surface, storing the geometric model data and repeating. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller,* 642 F. 2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co., Inc.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). While it may be true that Raskar only discloses projecting on a single surface, the surface of Miyamoto routinely changes orientation

with respect to the projector requiring at least occasional re-calibration (which appellant has frequently acknowledged elsewhere in appellant's brief) which would require using geometric model information for setting the target surface, storing the geometric model data and repeating.

Appellant argued with regards to claim 32 that Miyamoto alone or in combination with Raskar et al. and Connelly et al. does not teach positioning the at least one projector at a location by referring to layout information for a projector at a location. (See appellant's Issue A: Argument 7 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Appellant argued that none of the references positions the projector at a location by referring to the setting layout information. Miyamoto clearly positions the projector based on the layout of the surface to be projected upon as discussed above with respect to claims 18 and 40 (Cartesian coordinates marking the orientation and layout of the surface are layout information.)

Appellant argued with respect to claim 34 that Miyamoto alone or in combination with Raskar et al. and Connelly et al. does not refer to a stored geometric model for the location where the projector is to project. (See appellant's Issue A: Argument 8 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. Appellant argued that the projection unit does not refer to a geometric model as claimed. Miyamoto clearly refers to stored geometric models

(Cartesian coordinates as captured to locate the moving projection surface) as was discussed above with respect to claims 18 and 40.

For the above reasons, it is believed that Rejection I should be sustained.

II. Rejection of claim 4 under 35 U.S.C. § 103(a) in view of Miyamoto et al. further in view of Raskar et al. and Connelly et al. and Machtig.

Appellant does not address Rejection II.

Arguments which appellants could have made but chose not to make in the briefs have not been considered and are deemed to be waived. See 37 C.F.R.§ 41.37(c)(1)(vii)(2004). See also In re Watts, 354 F.3d 1362, 1368, 69 USPQ2d 1453, 1458 (Fed.' Cir. 2004).

For this reason, it is believed that Rejection II should be sustained.

III. Rejection of claims 7-13 and 33 under 35 U.S.C. § 103(a) in view of Miyamoto et al. in view of Raskar et al., Connelly et al. and Pinhanez.

Appellant does not argue claims 7-13.

Arguments which appellants could have made but chose not to make in the briefs have not been considered and are deemed to be waived. See 37 C.F.R.§ 41.37(c)(1)(vii)(2004). See also In re Watts, 354 F.3d 1362, 1368, 69 USPQ2d 1453, 1458 (Fed.' Cir. 2004).

Appellant argues with respect to claim 33 that Miyamoto alone or in combination with Raskar et al. and Connelly et al does not recite referring to the area layout information for positioning the system. (See appellant's Issue B: Argument 1 in the argument section of the amended appeal brief mail date 10/2/06.)

The examiner disagreed. The appellant argued that Miyamoto in view of Raskar and Connelly does not teach positioning the system at a location by referring to the area layout information. Referring to the claim language the area layout information is related to the interaction recognition system which is not taught by Miyamoto in view of Raskar and Connelly but rather I

s taught to be obvious by Pinhanez, which teaches layout information (such as the location of the "yes" and "no" in figure 9. Since only Pinhanez teaches a camera system (720) that is sensitive enough to allow interaction, that teaching must come form Pinhanez and accordingly it is irrelevant whether Miyamoto in view of Raskar and

Connelly teach layout information which the examiner does not concede, since the layout information for interaction recognition information and system is taught by Pinhanez to have been obvious to one of ordinary skill in the art at the time the invention was made.

For the above reasons it is believed that rejection III should be sustained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Andrew Sever

Conferees:

David Blum and Diane Lee

DIANE LEE
SUPERVISORY PATENT EXAMINER